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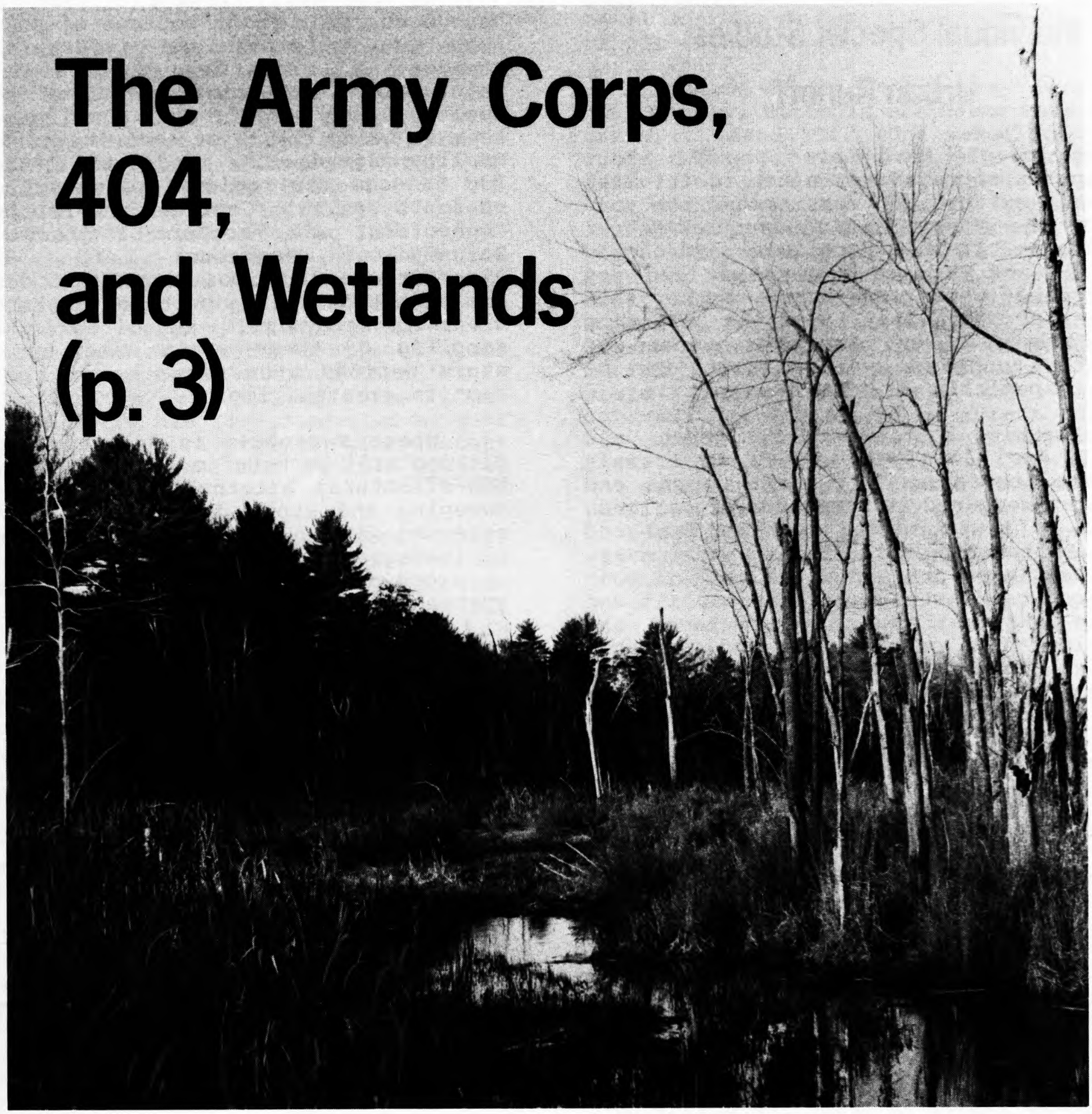
The Army Corps, 404, and Wetlands (p. 3)



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208 WATER QUALITY MANAGEMENT

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By Joseph M. Rinaldi, 208 Public Participation Assistant

Individual Special Studies: Urban Runoff

Most people have never thought about what happens to rainwater after it trickles down their gutters and runs across the yard and over the street to a nearby culvert or storm drain. If this particular hydrologic event has not crossed your mind then you have probably never considered whether this rainwater or stormwater runoff is polluting our waterways. Yet, the consequences of stormwater runoff on water quality can be severe, especially in urban areas.

Rainwater carries dirt, paper and other litter along with it as it travels over paved surfaces. It picks up gas and oil, often measured in thousands of gallons, as well as toxic metals such as lead and zinc. Phosphates and nitrates from over-fertilized lawns are added, as well as tons of dog and cat wastes. Because asphalt and concrete and rooftops have replaced the vegetation that once slowed and absorbed rainwater, this torrent of pollution has no place to go but into nearby streams where the effects of urban runoff (stormwater with its pollutant load) on water quality is often equivalent to, if not worse than, raw sewage.

The pollution picked up by stormwater comes from four major sources. The first is meteorological, or related to air pollutants. Industrial particulates rise from city smokestacks only to fall again on urban surfaces. Thin layers of these pollutants blanket the city with invisible poison. Together with normal dustfall, these meteorological sources find their way into stormwater with the first rain.

Traffic related pollutants are the second major source of urban stormwater pollution. Exhaust emissions from thousands of motor vehicles deposit the byproducts of fuel combustion up and down city streets. Oil and gasoline spills and invisible metals collect on pavements only to be washed away by tomorrow's rain.

People are the third source of stormwater pollution. Debris is contributed by city dwellers in enormous amounts. When the rains come this litter joins the rushing stormwater, headed for the nearest waterway.

The last source of stormwater pollution is urban construction. Sediment accumulates from erosion at construction sites, as well as trash and debris resulting from the construction activities. All four pollution sources mentioned ultimately join to cause urban stormwater runoff.

By the early 1980's a tradeoff will have occurred. Point sources of pollution, such as municipal and industrial discharges, will have been controlled to the point where non-point pollution sources, such as urban runoff, will equal or surpass them as being the major contributor to water quality degradation. Under the Connecticut 208 Program the regional planning agencies of South Central, Central, and Southwestern Connecticut will conduct a study of the Quinnipiac, Pequabuck and Rippowam River/Stamford Harbor areas to determine the magnitude of the problem. A large part of this study will be directed towards sampling of these urban waterways during storm periods when urban runoff pollution has its greatest impact.

Where a problem is defined, recommendations will be made to solve it. Low cost, non-structural alternatives such as street sweeping and storm drain cleaning will be selected first. If such measures prove to be inadequate, structural alternatives such as stormwater detention ponds or treatment systems may be required.

The major outputs of the urban runoff study will be:

A. Report (and accompanying maps of storm sewer/land use:

Estimated Pollution Loadings and In-Stream Affect on Water Quality Due to Urban Runoff.
November, 1977

B. Report:

Alternatives to Correct Urban Runoff/Water Quality Problems and Methods of Implementation.
November, 1977

Seasons Greetings from DEP

What You Should Know About 404

by Allan Williams,
flood management planner,
DEP Natural Resouce Center

A History of Controversy

In 1972, the U.S. Congress adopted the Federal Water Pollution Control Act Amendments. Its 106 pages contain extensive directives for abatement of water pollution and protection of existing water quality. Tucked away on a single page of P.L. 92-500 is Section 404, requiring the Army Corps of Engineers (COE) to regulate the disposal of dredged or fill material.

In its early days 404 slumbered under the shadow of other provisions. Interpretation of the brief paragraphs involved was traditional; the COE did not consider wetlands or non-navigable water courses to be regulated zones. This changed when the Natural Resources Defense Council sued the Army, claiming that the legislative intent required a considerably broader interpretation of the law. On March 27, 1975 the District Court for the District of Columbia ordered the Army to publish new regulations incorporating streams tributary to navigable waters and adjacent waters. Adjacent or contiguous waters have since been interpreted to include most wetland forms. Consequently the COE has issued several sets of regulations and rules with the most recent being published in the July 19, 1977 Federal Register.

Nationwide, there has been mixed reaction to the program. Many states and localities do not consider the 404 program to be simply water quality legislation, but rather a form of federal intervention in local land use decision making. States which already have wetland protection statutes object to the extra layer of regulation which could require a landowner to obtain both state and federal permits for the same project if the land meets the definition of a wetland under both state and federal law. There are also many interests which object to any additional resource regulations. On the other hand, there are only eight states which have both inland and tidal (or shoreline) wetland protection, and only approximately twenty states which have protection for some form of wetland. All the Atlantic states have at least some tidal protection.

By expanding the scope of regulation, the district court recognized that the water quality of a major water course could not be separated from the water quality of the many small tributaries that nourish it. While the 404 program may be similar to regulatory programs already in place in some states, it also provides protection for interstate waters. For example, Connecticut now has the opportunity of commenting on activities in Massachusetts which will affect the Connecticut and Housatonic Rivers.

In addition, the existence of a national standard for regulation of certain waters will discourage the type of development that would locate in areas without protective statutes. States with existing wetland statutes, like Connecticut, would not be at a disadvantage in attracting new development.

Because of the controversy surrounding the program, attempts are being made in Congress to amend 404. One school of thought would like to return to the traditional definition of navigable waters, a definition which does not include adjacent wetlands and non-navigable waters. HR 3199, which incorporates this view, has passed the House of Representatives. The Senate, however, passed S. 1952, which transfers authority for waters tributary to navigable waters from the COE to the U.S. Environmental Protection Agency (EPA). The COE would retain authority for navigable waters. The EPA would be able to delegate its authority to states with wetland programs. The Senate version would not change the expanded scope of the 404 coverage. The conflict between the two houses of Congress surfaced last year, but no final resolution was achieved. While the matter is expected to be resolved in this session (within several weeks), as yet, no conference has been scheduled to settle the differences.

In a recent letter to Carl Shuster of the Bloomfield Planning and Zoning Commission, Commissioner Stanley J. Pac voiced the Department's feelings.

"While the Department of Environmental Protection would like to avoid the duplicative nature of the 404 programs, we do recognize the value of the program nationwide. Therefore, the Department would favor a compromise amendment to the 404 program which would not prevent protection of nationally significant wetlands, but would allow for home rule in those states, such as Connecticut, which have enacted their own wetland program."

Authority and Areas of Regulation

Specifically, what is the 404 program? It is found at Part 323 and Appendix A of the Rules and Regulations of the Corps of Engineers, U.S. Department of the Army. It is the regulation of discharges of dredged and fill materials into waters of the United States. It does not regulate removal of material.

Waters of the U.S. include:

1. "Territorial seas."

2. "Coastal and inland waters, lakes, rivers, and streams that are navigable waters, . . .including adjacent wetlands."

3. "Tributaries to naviable waters including adjacent wetlands."

4. "Interstate waters and their tributaries, including adjacent wetlands."

5. "All other waters. . .such as isolated lakes and wetlands, intermittent streams, prairie potholes, and other wates. . .the degradation or destruction of which could affect interstate commerce."

Navigable waters are:

"those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity."

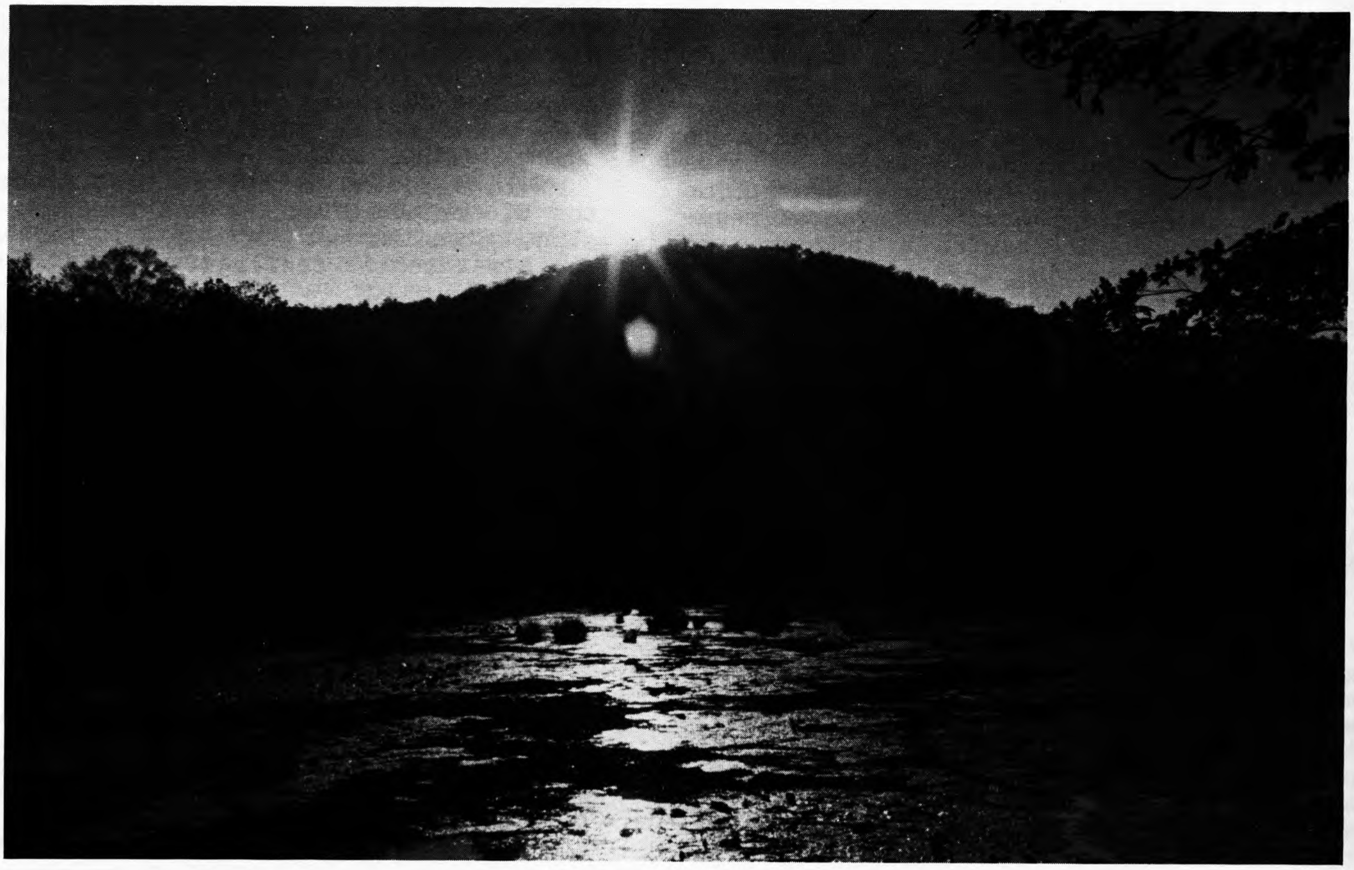
The types of activities covered by that definition are much broader than one might at first imagine. For example, "commerce" may include historical use of "canoes or frontier craft," transportation of logs, or the presence of recreational craft. A watercourse may be navigable despite the presence of falls, rapids, bridges, or other obstacles if upstream sections of water courses have been utilized for commerce.

While the 404 program includes all waters of the United States, the definition of wetlands is not synonymous with those under Connecticut statutes: Connecticut's wetland definitions, and hence the state's areas of regulation are more inclusive. Connecticut inland wetlands are defined by soil types and our tidal wetlands by vegetation types. The COE regulates those areas which are inundated at a frequency and duration to support aquatic plants, but they must be in an area adjacent to a water course with a mean annual flow of at least five cubic feet per second. No such requirement exists in the Connecticut statutes.

The Permits

There are three levels of permits: Nationwide, General and Individual.

The Nationwide Permit requires no application and is not a "permit" in the normal sense of a piece of paper held by an individual which states he may do something.



It is rather a blanket permission for specific types of discharges and areas. The following activities and activities in the following areas are permitted, automatically without written application or written permission.

1. Discharge of less than 500 cubic yards not in navigable waters deposited before January 25, 1976.

2. "Non-tidal rivers, streams, and their impoundments including adjacent wetlands that are located above the headwaters." Headwaters is defined as "the point on a non-tidal stream above which the average flow is less than five cubic feet per second." (5 cfs)

3. Natural lakes and adjacent wetlands less than 10 acres which are fed or drained by sources above the headwaters.

4. Isolated natural lakes and adjacent wetlands less than 10 acres.

5. Other non-tidal waters not a tributary to interstate or navigable waters.

6. Utility line crossings where no change in bottom contours occurs. (When the activity does not include coffer dams or construction access roads.)

7. Material for bank stabilization, when less than 500 feet in length, and averaging less than one cubic yard per running foot of bank.

8. Minor road crossing fills.

9. Fill placed incidental to construction of bridges.

10. Repair or rehabilitation of currently serviceable or previously authorized fill.

While no application is required, there are special conditions to many of the activities. There are also general conditions which apply across the board.

1. The activity cannot destroy a threatened or endangered species.

2. Material must be free from toxic pollutants.

3. Fill must not be subject to erosion and other non-point pollution.

4. The discharge must not be in a wild and scenic river system, either federal or state.

5. The discharge cannot be in proximity to a public water supply intake or in an area of concentrated shellfish production.

6. The activity will not disrupt aquatic life indigenous to the water body.

In addition to conditions, the District Engineer (in Connecticut, that would be the New England Division Engineer) has the discretionary authority to require Individual or General permits on any activity in any waters of the United States if the individual or cumulative impact may be significant.

The District Engineer may issue General permits for categories of activities which minimally impact waters of the United States. Presently, the New England Division has approximately twenty General Permits, of which four apply to Connecticut. They cover: "Minor Soil and Water Conservation Practices," "Small Logging Roads and Stream Crossings," "Minor Roadway Modification Projects," and "Small Pile and Timber Piers (Docks), floats, and mooring buoys in navigable waters."

While these permits are official, applications and information brochures are yet to be formalized. In developing General Permits the Division Engineer must require conditions which limit the quantity of fill and delineate the activity and type of water course that may be involved. The Division Engineer may also require the permittee to report on the progress of the project. A General Permit may also be revoked at the Division Engineer's discretion.

The Individual Permits cover all activities in water of the United States not covered by general or nationwide permits. Criteria for evaluation of physical, chemical, and biological processes which may be affected by a dredged or fill project are noted in the Federal Register, September 5, 1975. These criteria have been prepared by EPA and COE.

Review of individual permits requires numerous considerations. According to the Federal Register:

> "decision whether to issue a permit will be based on an evaluation of the probable impact of the proposed activity and its intended use on the public interest."
>
> "All factors which may be relevant to the proposal must be considered; among those are conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production, and, in general, the needs and welfare of the people. No permit will be granted unless its issuance is found to be in the public interest."

As can be seen by the above, the 404 considerations are much broader than those of our wetland and water course statutes, which do not include protection of such variables as aesthetics, historic values, or energy concerns.

Program Mechanics

The working details of the 404 program are also of interest. For example, the COE 404 program is not to be considered as federal review of state wetland decisions. The COE has no authority to overrule state and municipal wetland decisions. However, it is likely that our tidal and inland permit decisions will provide a basis for the COE analysis, although the COE will request review by EPA and the Fish and Wildlife Service, among other agencies. It is not necessary, though, for an applicant to wait for a state permit before applying to the COE. In fact, it is recommended that an applicant file concurrently with state and federal agencies. Except where there is considerable public controversy, it is likely the COE will approve those projects also approved by state or municipal wetland agencies. The COE assesses a $10 fee for approved permits for non-commercial work, and a $100 fee for approved permits for commercial work.

Recently, some questions were asked of Morgan Rees, Chief of the Regulatory Branch of the New England Division of the COE. His responses shed light on other aspects of the 404 program.

Q: Does the COE automatically inform wetland commissions of all permit applications?

A: Copies of the applications are sent to the municipal executive officer and to the Conservation Commissions. The COE depends on the state and municipalities to inform them of who is the designated wetland agency head.

Q: Does one have to notify COE to get a Nationwide or General Permit?

A: No - for the nationwide. Yes - for the general. An application and permit must be processed, but it is much less cumbersome than individual permit processing. In addition, it can only be for an already established general permit class.

Q: Who determines if the regulations apply?

A: COE. Essentially, the COE spots the location on a USGS quad. They then compute the drainage area. If it's less than 3 square miles they assume there is less than 5 cfs flow and, therefore, the nationwide permit applies. Above 3 square miles an individual permit is necessary. Between 3 and 5 square miles a judgment is made. A field inspection would be necessary if there is a violation, or if it is a borderline case.

Q: How many new staff has the COE hired (for New England Division) to process 404's?

A: They have increased their entire permit section from about 13 to about 40-45. But their work load has quadrupled. The application backlog has decreased somewhat. How much of the increase in permits and staff is due to 404 is unknown, as the COE does not maintian a tally of the different permits.

Q: How many 404 applications does the New England Division expect to process in a year?

A: COE doesn't separate 404 from other permit actions, but it's probably about 1,500.

Q: How long will it take to get a permit under the General class?

A: A few days.

Q: How long will it take to get an Individual Permit?

A: If it's routine, probably 3-4 months. However, the average would be about 4 1/2 months. It may be misleading to use averages because the time varies with type and size of project.

Q: Does the Connecticut Department of Environmental Protection get a copy of the permits?

A: No. They get a monthly listing of those issued.

Q: What must the Connecticut Department of Environmental Protection do in terms of 401 permits (Water Quality Certification)?

A: The state may approve, disapprove, or waiver the process. If the state does not act within three months, the COE may consider that as a waiver. In the waiver process the COE requires certification that a state agency has received a request and three months elapsed without negative comment from that agency. The COE may afford a state up to one year for its determination if special circumstances warrant it.

Q: Where can one obtain a list of standard conditions, application forms, and additional information?

A: Permits Branch, U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02154
(617) 894-2400, Ext. 332

Survey of Local Open Space Regulations

Editor's Note:

Last July, Jack Gunther, Chairman of the New Canaan Conservation Commission, conducted a statewide survey of Connecticut municipalities to determine: 1) how many require a portion of a proposed subdivision be set aside as open space; and 2) how many have adopted regulations for "Conservation" or "Cluster" zoning.

His objective was to encourage and help local land trusts acquire additional open space land without the need for public or private funds and to determine the extent to which conservation has become recognized as an essential ingredient in planning and zoning.

Mr. Gunther mailed a questionnaire to the Connecticut Conservation Commissions and local Land Conservation Trusts. He received responses from 122 citizens representing 105 towns.

Because we felt our readers would be interested in the results of Mr. Gunther's study, we publish it below with our thanks to the author for his permission to print it.

Statistics

The replies from the one hundred and five Towns indicate the following:

1. Thirty-four Towns have Regulations providing for the reservation of open spaces in subdivisions;
2. Eight Towns have Regulations covering Conservation, Cluster or Open Space Zoning;
3. An additional twenty-six Towns have both 1 and 2, or a total of sixty-eight Towns are involved in preserving open spaces through Planning and Zoning;
4. In at least fifteen Towns, open space land set aside in a subdivision has been conveyed to a Land Trust, and several other replies were "could have been" and "working on it"; and
5. In at least six Towns open space land resulting from Conservation Cluster, or Open Space Zoning has been conveyed to a Land Trust.

Subdivision Background

The authority of Planning Commissions to require the reservation of "open spaces" in subdivisions is contained in Chapter 126, Section 8-25 of the General Statutes of Connecticut:

> "the commission may provide open spaces for parks and playgrounds when, and in places, deemed proper by the planning commission, which open spaces for parks and playgrounds shall be shown on the subdivision plan."

Many readers may be surprised to know that the statutory reference to "parks and playgrounds" goes back to Section 8-58 of the General Statutes of Connecticut, Revision of 1949 (probably first adopted in 1947), which was long before the environmental problems resulting from the population explosion were generally understood. At that time the emphasis was on facilities for active recreation rather than on open spaces to maintain environmental quality.

The difficulty with the language of the statute is that many Towns, as in the case of New Canaan, were reluctant to hold title to a number of areas within the strict definition of "parks and playgrounds" due to the difficulty of supervision, the cost of maintenance, and the increased exposure to public liability suits. Also some did not wish to become involved in the complications which can arise when the ownership is vested in a landowners' association or similar body.

However, more than 20 years later when the environmental problems arising from rapid development were clearly defined, the Supreme Court of Connecticut interpreted the statutory language in the light of the crying need to preserve open spaces. In the leading case upholding the constitutionality of the statute (Aunt Hack Ridge Estates, Inc. vs. Planning Commission of the

City of Danbury, 160 Conn. 109, decided in December, 1970), the opinion of Chief Justice Alcorn contains the following:

"in these days of burgeoning populations, critical housing problems and the incentive which they create for the activity of land developers, the need for parks, recreational areas and open space for the welfare of people looms large."

Cases "hold that a requirement that the developer dedicate open space to the public is valid on the ground that the bruden imposed on him is uniquely attributable to his own activity because the increase in population in the area which will result from that activity is productive of the need for open space..."

Current Trends

Practices vary widely throughout the State. One extreme is where the Town takes title to all of the reserved areas. The other extreme is where the Land Trust is the main recipient. Some Towns have not enforced their Subdivision Regulations because they have failed to work out a procedure whereby an appropriate and willing organization acquires ownership of the reserved areas.

The following are examples of Regulations which recognize Conservation as a goal and include "open spaces" in addition to "parks and playgrounds":

> GUILFORD - "Land for parks, playgrounds, recreation areas and natural open spaces shall be provided and reserved in each subdivision...as deemed necessary and in locations deemed proper by the Commission."
>
> MIDDLEBURY - "Land for parks, playgrounds, recreation areas and open spaces shall be provided..."
>
> RIDGEFIELD - "The plan should show and the Commission may require that a portion thereof be reserved as open space for a park, playground or other conservation purposes."
>
> WOODBURY - "Open spaces for recreation, conservation purposes, parks and playgrounds shall be provided..."
>
> KILLINGWORTH - "The Commission may require such open spaces for parks, playgrounds, or other public uses as it may deem necessary or appropriate for the health, safety and enjoyment of the present or future residents of the subdivision and the Community... The Commission may require that all or any portion of the reserved area shall be left wild."
>
> WILTON - "The Commission may require that a portion of the subdivision be reserved as open space for parks, playgrounds or other recreational purposes..."

Size

The prevailing requirement is that up to 10 or 15 per cent of the total area of the subdivision may be reserved by the Planning Commission (Wilton, Greenwich, Harwinton, Coventry, Ridgefield, Darien, Redding, Killingworth, Newtown).

Woodbury requires that "not less than 15% of the total area of the subdivision or resubdivision shall be so reserved, unless the Commission, in its sole discretion, determines that a lesser area is sufficient..."

Middlebury provides a guideline of 1,000 square feet of open space for each building lot. Guilford has a guideline of 4,000 square feet for each building lot. East Lyme provides for open space at the rate of one acre for every thirty families.

The minimum size of the reserved open space area should be at least one acre (Wilton, Darien, Woodbury, Harwinton, Middlebury). Exceptions are made when the reserved areas are adjacent to land owned by the Town or a Conservation organization.

A number of Regulations provide that the Planning Commission shall consider the following in determining the size of the open space area to be reserved:

1. The adequacy of existing parks, playgrounds, recreation areas and open spaces available in the neighborhood;

2. The non-existence of land in the subdivision suitable for reservation as open space; and

3. The reserved area would be less than a minimum of one acre and, if less than the minimum, can it be added to adjacent land owned by the Town or a Conservation organization.

Ridgefield has adopted a comprehensive Regulation covering the size of the reserved open space area. If the 10% reserved area is less than 2 acres, "the Commission may require that the open space area be located at a suitable place on the edge of the subdivision so that additional land may be added at such time as the adjacent land is subdivided." Contributions of small areas by the subdivider to a "green belt" are credited to the open space requirement. Under certain conditions, the Commission may accept a cash contribution at the rate of $300 per lot in lieu of the land requirement to be used solely for the acquisition of open spaces.

Access and Maintenance

When the reserved area is to be preserved as natural open space, many planning officials are of the opinion that any requirement for public access is satisfied by a legal right of way on foot to the boundary of the open space area, permitting the public to enter upon the premises. They are also of the opinion that no maintenance is required in the open space area.

The Greenwich Regulations refer to "Park and Playground use" and provide that the area reserved for park and playground purposes on the Subdivision Plan shall be owned and maintained by an association of property owners within the subdivision. The Commission waives this Regulation to permit developers to convey to the local Land Trust natural areas, such as wetlands, which are earmarked as "open space" on the subdivision map. The local Land Trust will not accept a reserved area earmarked as "Park" due to the possible legal obligation to cut and maintain trails.

In another Town, the Land Trust will accept reserved areas earmarked as "Park" on the ground that a Park includes open space areas to be perserved in their natural state without the maintenance of trails. In some Towns, even though the Regulations refer only to Parks and Playgrounds, the Planning Commissions will earmark the land to be conveyed to a Land Trust as open space.

Stewardship

A good number of Subdivision Regulations do not contain any provision for the ownership of the reserved open space area (Wilton, Middlebury, Ridgefield).

Another category of Regulations provide that the ownership shall vest in either the Town, the landowners in the subdivision directly or through an Association, or a Conservation organization and the local Land Conservation Trust may be named (East Lyme, Guilford, Harwinton, Woodbury, Killingworth).

Conclusion on Subdivisions

The responses to the questionnaire and the follow-up phone conversations with a large number of planning officials provide convincing evidence that "meaningful" open space land can be preserved in subdivisions, and that local Land Conservation Trusts play a crucial role in solving ownership problems. The potential for saving open spaces throughout the State of Connecticut is dramatic.

The survey establishes that a good number of Towns have adopted highly satisfactory procedures in cases where the Town does not wish to own the open spaces. The most successful procedures are based on cooperation between the Planning Commission, the developer and the local Land Trust. The preferences of the developer are recognized and legal hassles are avoided. The Land Trust participates in the early planning stage and has the opportunity to express its view as to the location of the most meaningful open space area in the land to be subdivided (the type of natural area a Land Trust ordinarily acquires by gift). The end result is that the developer discharges a legal requirement by voluntarily conveying to the Land Trust the area earmarked as "open space" on the subdivision map.

Among the more successful Towns to be complimented for their contributions to the preservation of significant open spaces (natural areas) in subdivisions are the following: Redding, Killingworth, Wilton, Guilford, Darien, Ridgefield, Greenwich, Woodbury, East Lyme, Griswold and Newtown.

The most flexible procedure is where the Town Planner (or other agent of the Planning Commission) suggests that the subdivider (developer) work out with the local Land Trust an acceptable area of open space, and then submit a proposed subdivision plan showing the area to be deeded to the Land Trust, accompanied by the proposed deed to the Land Trust.

As an alternative, if the planning official and the developer agree upon the open space area to be reserved, the planning official may suggest that the developer determine whether the area is acceptable to the Land Trust.

Another approach is where an informal committee, representing the Planning Commission, the Conservation Commission and the Inland Wetlands and Water Courses Commission, is formed to work with the developer and the Land Trust in selecting the most desirable open space area in the subdivision.

In some Towns, the developer is given the option (a) deed the reserved area to the landowners in the subdivision either directly or through an Association or (b) deed the land to the Local Land Conservation Trust.

Experience shows that developers usually prefer to deal with the Land Trust which has established procedures for acquiring land (as compared to setting up an Association of Landowners). The developer understands that the natural areas having the greatest ecological significance for the Land Trust (thick woods, swamps and marshes) are generally the most costly to develop. Also, the real estate tax relief is certain when the land is deeded to a Land Trust.

For example, the Land Trust in Redding has received title to more than 20 areas of open space land reserved in subdivisions. The Land Trusts in Greenwich and Killingworth have each received over 10 areas, and the Land Trusts in Wilton and Darien have each received at least 5 open space areas.

I hope that this tremendous potential for the acquisition of natural open space areas will encourage the formation of local Land Conservation Trusts in Towns where none exist. I also hope that this report will provide an impetus for Planning and Zoning Commissions to adopt appropriate Subdivision Regulations whereby natural areas can be reserved and conveyed to a local Land Trust.

Conservation, Cluster, Or Open Space Zoning

Planning Commissions have a great deal of discretion in establishing Regulations for this type of zoning.

As an example, Darien has adopted new Regulations whereby the number of lots in the Subdivision is established in the conventional manner after the reservation of 10% for open space. The developer then redesigns the subdivision with the same number of lots but the lot size may be reduced down to one-fifth of an acre. If the revised plan is approved by the Commission, the open space may be conveyed to the Darien Land Trust.

In a Greenwich Conservation Zone, 40% of the area is kept as open space in the case of detached houses and 50% in the case of attached houses. The minimum size of the area is 10 or 20 acres depending on the zone. The "conservation land may be conveyed...to a local Land Trust."

In a Ridgefield Cluster Zone, 30% to 40% of the land being developed remains as open space which, preferably, will be conveyed to a Land Trust owning adjacent land.

In a Westport Open Space Subdivision, the lot size can be reduced by 50%. In a Woodbury Open Space Subdivision, 30% of the total area will be designated as open space and the ownership may be vested in a Land Trust.

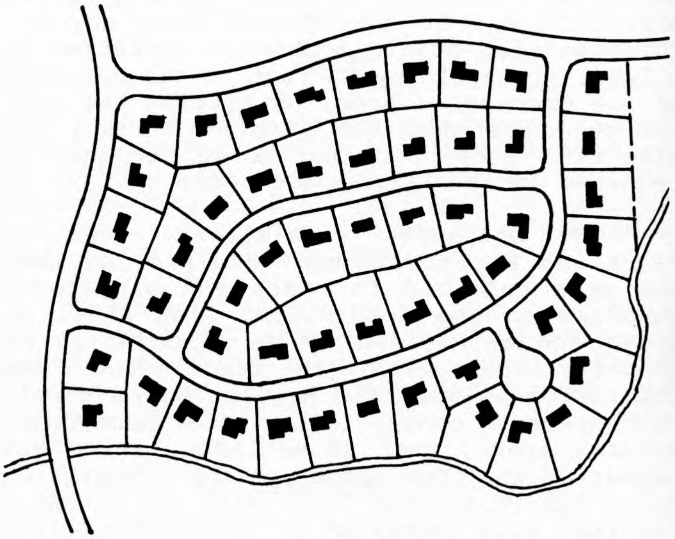
Closing

I will be glad to act as a "Clearing House" for your questions as I have collected information which could not be covered in this Report. I suggest that your questions be accompanied by a self-addressed, stamped reply envelope.

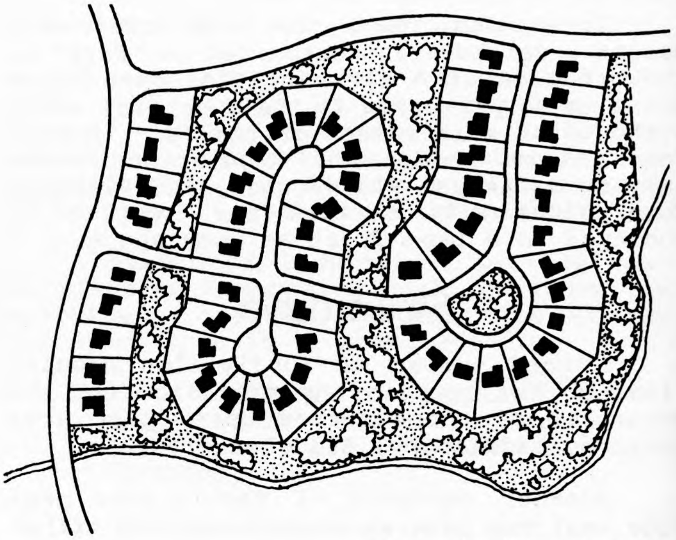
Inquiries should be addressed to:

Mr. Jack Gunther, Chairman
New Canaan Conservation Commission
P.O. Box 487
New Canaan, Connecticut 06840

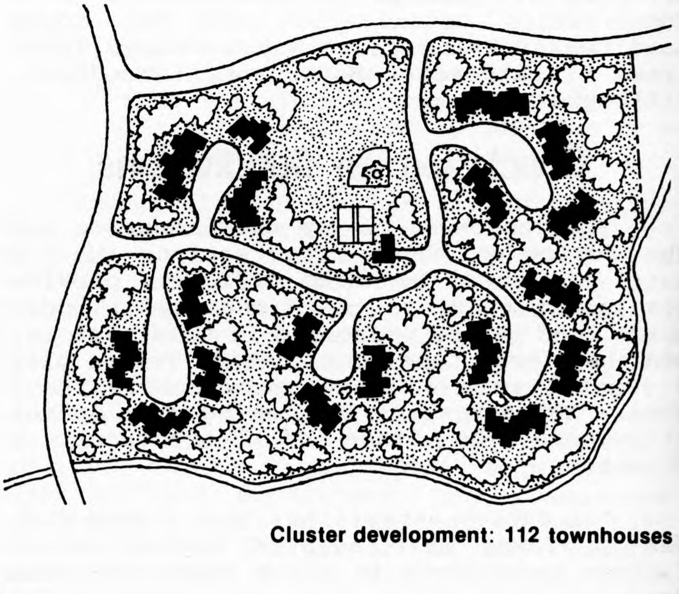
Cluster development



Site: 30 acres; 54-lot subdivision



Cluster development: 54 lots



Cluster development: 112 townhouses

coastal
area
management
71 capitol avenue hartford, conn. 06115

CAM NEWS

CAM Wants Your Opinion

Public participation is a key aspect of the CAM Program. It is critical not only because it is formally required in the federal Coastal Zone Management Act, but because the Connecticut CAM staff believe that the program will be more effective and meaningful if those affected by it have the opportunity to take part in its development. CAM has been encouraging citizens and interest groups to contribute ideas and opinions at every stage in the formation of Connecticut's coastal management program.

One important part of CAM's public participation effort is the questionnaire contained in A Citizen's Handbook to Coastal Area Management, distributed at CAM's public workshops last summer. It is designed to find out 1) what coastal issues citizens feel are most important; 2) if they feel Connecticut should adopt a coastal management program; 3) whether or not they agree with CAM's recommendations; and 4) if not, what they recommend. High questionnaire returns are essential. Although views expressed at CAM's public meetings are being considered, the questionnaires provide a more consistent format for surveying public opinion. If you need a copy of the Citizen's Handbook, please contact the CAM office and one will be mailed to you immediately.

CAM's public participation program is somewhat unique because it has attempted to involve the public from the beginning in decisions about what the management plan should be. This level of participation may be unfamiliar to most citizens who are accustomed only to reacting to government proposals. We have been asked if public opinion would be ignored if it didn't correspond with CAM's recommendations. To the contrary, if public reactions don't support CAM's recommendations, the CAM advisory board will revise its approach accordingly.

Some citizens have expressed concern that it is too late for their opinions to be taken into consideration because CAM is now preparing legislation. However, it is draft legislation and will probably be revised several times before it is finalized and passed. Also, public meetings will be held on the legislation before it is submitted to the General Assembly.

CAM is serious about public participation and it is not too late to express your opinions. Please get a copy of the Citizen's Handbook, fill out the questionnaire and return it to the CAM office.

Having A Meeting?

If you are a member of a group or organization interested in learning more about coastal area management, why not contact the CAM office and arrange to borrow a film or slide show on CAM or coastal resources? Staff and CAM Advisory Board members are also available to present the film or slide show, to answer questions about it and to lead a discussion about the CAM Program.

The following are available for public use. Call the CAM office (566-7404) for scheduling.

It's Your Coast (28 minutes) discusses coastal problems, the value of the coastal area, and what coastal area management is.

Estuary (28 minutes) and Estuarine Heritage (28 minutes) discuss the importance of estuaries as fish and wildlife habitat and stress the need for wise and careful planning for their future.

Offshore, Onshore (60 minutes) investigates the potential onshore impacts of oil exploration and development on Georges Bank.

The Great American Fish Story - The Northeast (28 minutes) depicts the catching, processing and marketing of fish and shellfish in the New England area.

The Historical Slide Show (30 minutes, accompanied by a written script) views economic, ecological, recreational and cultural aspects of Connecticut's coastline from an historical perspective.

The CAM Program Slide Show (30 minutes) provides an up-to-date summary of CAM's recommendations for a management program and preliminary legislative proposals. Coastal history and background information on coastal management are included.

Editor's Note: the CAM Program publishes Land's End, a quarterly newsletter about coastal issues and CAM activities. If you wish to receive Land's End, which is available free of charge, contact the CAM Program at 71 Capitol Avenue, Hartford, Connecticut 06115 - telephone 566-7404.

A State Soil For Connecticut?

By Edward H. Sautter
State Soil Scientist
USDA, Soil Conservation Service
Storrs, Connecticut

Soil is a thin mantle that covers most of the earth as the skin on an apple. It is an important source of many of our basic needs -- food, clothing, shelter, and fuel. Soil serves as a medium for disposal of our wastes. It supports our homes and buildings and is the foundation for our roads and airports. Soil also provides the base for our recreation facilities and is a determining factor in our aesthetic surroundings.

Connecticut needs to recognize and take pride in its soil. A way to do this is to declare one of our many soils as a state soil. We have a state mineral--garnet; a state tree--white oak; a state animal--the whale; a state insect--the preying mantis; and a state bird--the robin. I propose that in 1978 the state legislature adopt a state soil. There are more than 100 to choose from.

Soil science and the recognition of soils as natural bodies is relatively new. The soil survey had its beginning in 1885. V.V. Dokuchaev, a great Russian scientist, first observed soils as scientific objects of inquiry. In the first quarter of our century, C.F. Marbut, a geologist applied the ideas of Dokuchaev to the soils of the United States. One of our nations "pioneer" soil surveys was made in the Connecticut Valley in 1899.

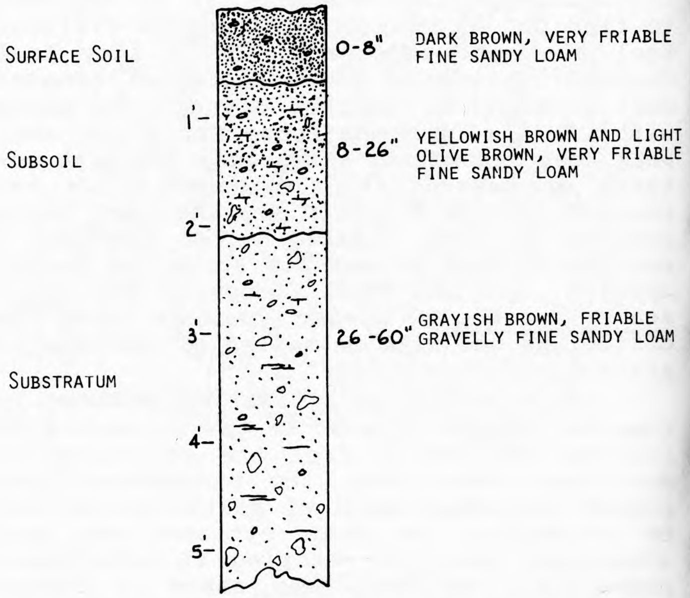
Because soil science is so much younger than geology and biology, most of us do not visualize soils as scientific beings. However, soil is every bit as real and as important as minerals, trees, animals, insects, and birds. A modern soil survey is being made in Connecticut by the Soil Conservation Service of the United States Department of Agriculture in cooperation with the Connecticut and Storrs Agricultural Experiment Stations. Soil scientists have been studying, describing, classifying, and mapping the soils of the state for many years. Thanks to these efforts, we are now ready and able to recognize our soils.

The present ecological awareness that has helped us appreciate our environment, makes designation of a state soil a natural step. We rekindle long-time concern for control of erosion, lest we lose the very soil that supports us and most other forms of life familiar to us. Protection of development sites, no till farming, and other conservation practices are emerging out of a determination of Connecticut residents to keep our soils from eroding.

I propose that Charlton fine sandy loam be designated as the Connecticut state soil. The accompanying sketch shows a cross section of Charlton fine sandy loam to a depth of five feet. Like a slice from the side of a basement excavation, this "soil profile" depicts the surface soil, subsoil, and substratum layers. Charlton fine sandy loam has high potential for producing food, feed, forage, fiber, and ornamental crops. It has few use restrictions for woodland production, for community and recreational development, and for wildlife habitat. Charlton fine sandy loam is one of the many soils in the state that best represents Connecticut's developmental and agricultural base.

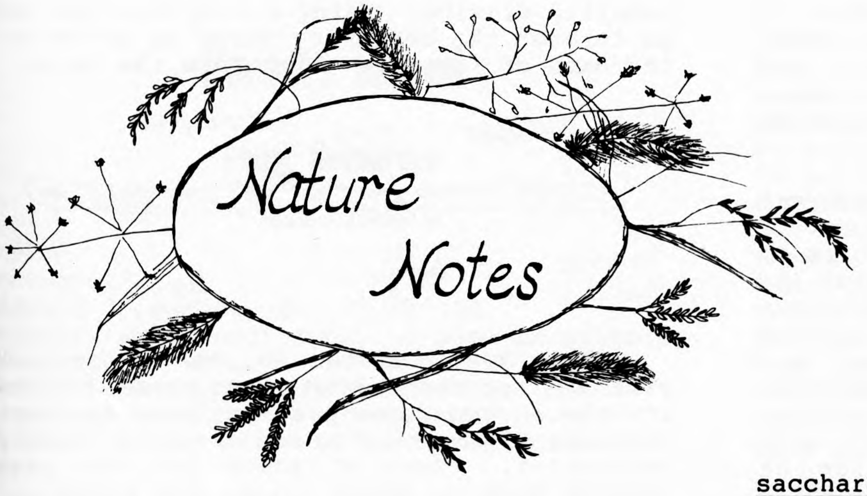
Charlton

FINE SANDY LOAM


SURFACE SOIL
SUBSOIL
SUBSTRATUM
1'
2'
3'
4'
5'
0-8"
DARK BROWN, VERY FRIABLE FINE SANDY LOAM
8-26"
YELLOWISH BROWN AND LIGHT OLIVE BROWN, VERY FRIABLE FINE SANDY LOAM
26-60"
GRAYISH BROWN, FRIABLE GRAVELLY FINE SANDY LOAM

Charlton fine sandy loam formed in thick, loamy deposits left by the last glacier. It has taken ten thousand years to develop. Forests grew on the soil during its period of development. Minerals weathered to release plant nutrients and the forest accummulated them in the humus enriched surface layer. Charlton fine sandy loam was officially recognized by federal and state soil scientists in 1922. Its distribution extends throughout Connecticut.

At the beginning of our third century as a nation, it is fitting that we recognize our debt to the soils of Connecticut for support of our life and for our hopes for future well-being. Let us pay tribute to this great natural resource by designating Charlton fine sandy loam as the state soil for Connecticut.



Nature Notes

written and illustrated
by
Penni Sharp

Your December Environment

December is: *the winter solstice...Christmas fern green on the forest floor...chickadees brave the snow...rabbits feed on apple twigs...frost hardens the ground...the woodchuck sleeps...overwintering robins feed on berries...hungry birds visit feeders...sumac berries red against a gray landscape...snowmen on front yards...*

Winter Trees

Although the most spectacular season for deciduous trees is autumn when maples, birches and dogwoods set the landscape ablaze with color, trees in winter are graced with a more subtle beauty. Once the leaves have dropped to the ground, the structure of an individual tree can be seen. At this time of year, the features of the twigs and branches stand out against the stark landscape.

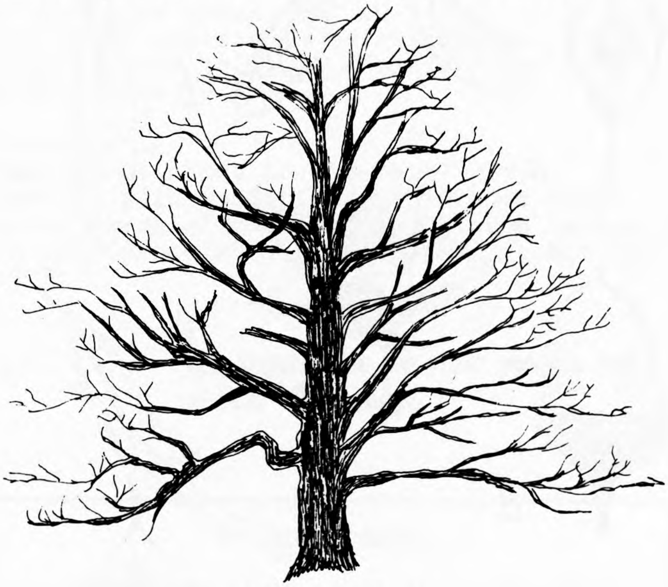
A stand of trees appears not as a mass of green, as in summer, or as an array of colors as in fall, but as individuals, each with certain aspects common to its particular species.

Through recognition of observable similarities of form, trees can be readily identified in winter once one is accustomed to looking for key features. Some of these features are the overall shape of trees, the nature of the bark, the twig, and the seeds or fruit, if present.

The Shape of a Tree

Deciduous trees in Connecticut have a variety of shapes. Perhaps the tree that most readily comes to mind for this feature is the lovely vase-shaped American Elm (Ulmus americana). Chosen for its grace, this tree once lined the streets of many New England towns. Today, it has largely disappeared due to a fungal infection caused by the Dutch Elm Disease (Cephalosporium sp.)

Several of our Connecticut trees have an oval shape. The sugar maple (Acer saccharum) when open grown, has classic egg-shaped lines tapering at the top, whereas its relative, the red maple, (A. rubrum) again oval shaped, is often broader at the top. Ash trees (Fraxinus americana) and tulip trees (Liriodendron tulipifera) also share the oval shape. More oblong in appearance are some of the hickories, the shagbark (Carya ovata) and pignut (C. glabra). Their branching is more angular, and the trees lack the smooth, ovate shape. A tree that can attain a memorable shape when permitted to grow in the open for many years is the white oak (Quercus alba). The branches of this tree will spread out to the side, broader than the tree is tall. A large old oak is a spectacular sight!



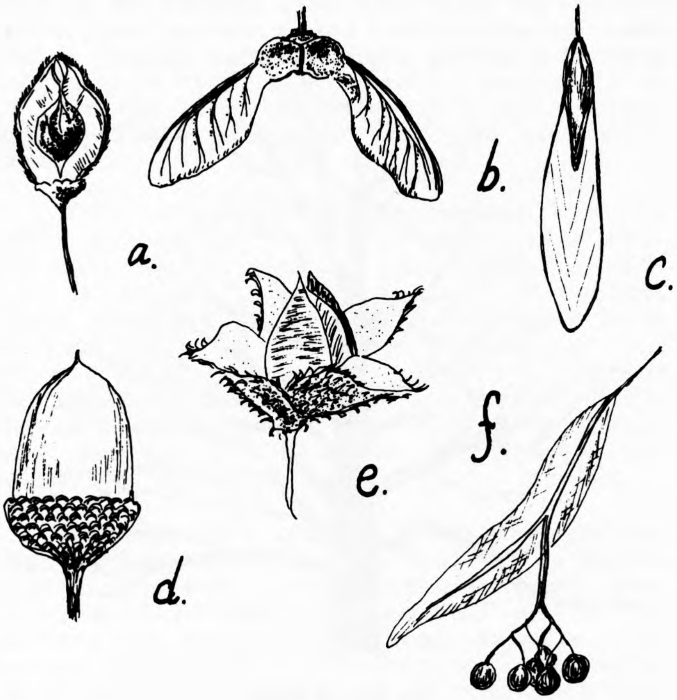
The Bark of Trees

The bark of a tree often provides the first clue to a tree's identity and, in some cases, is all that is needed to make a correct identification. For example, the beech tree (Fagus grandfolia) has very distinct bark; it is light gray and smooth all over. In marked contrast to the smooth beech bark, is that of the shagbark hickory whose name aptly describes it. The bark on this tree is dark in color and peels off in long strips. The sycamore (Platanus occidentalis) is another with distinctive bark. In this case the bark has a mottled brown and white appearance showing creamy white in areas where the old bark has peeled away. The bark of birches (Betula spp.) and cherries (Prunus spp.) have prominent horizontal lenticels, corky spots on the bark which originate as breathing pores.

In looking at the barks of different trees, notice whether the bark pattern is horizontal or vertical, whether the bark is ridged or smooth, what color it is, what its texture is. Make "rubbings" of different tree barks. This can be done with rubbing wax or crayons. Tack a piece of paper to a tree and gently rub the wax or crayon back and forth across the paper keeping an even pressure. An imprint of the bark will appear on the paper. A collection of rubbings can be useful aids in tree identification.

Tree Fruits and Seeds

The seeds of many trees persist on the tree during winter. An example is the tulip tree which bears floral shaped clusters of seeds on its dark bare branches. These fall to the ground eventually and are consumed by birds and squirrels. Below are drawings of tree seeds from trees common to this area. Can you match the seed to the tree?

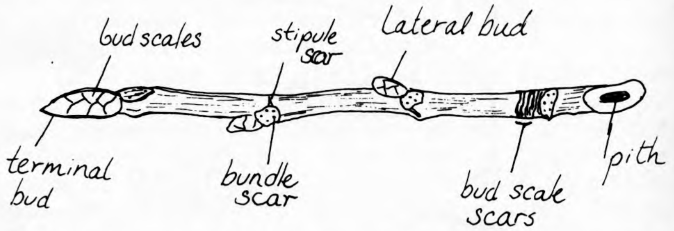


White ash
American beech
Basswood
American elm
Sugar maple
White oak

See bottom of page for answers.

Twigs

If the shape of the tree and the bark do not provide enough clues to identification, then collect and examine a twig. The different parts of a twig are shown on the labelled drawing. Using a twig key, one can go through the necessary steps to arrive at the name of the tree which bore the twig.



Twig keys are fun to use and several will be recommended at the close of the article. Again, many trees have distinct features to their twigs and are thus readily recognized. Some of these are the long pointed buds on beech twigs, the green and aromatic twigs of sassafras (Sassafras albidum), the zig-zag, sand papery twigs of elm and the wintergreen smell of the black birch (Betula lenta) twig.

Appreciating Trees

These are many clues that will be useful in learning to recognize some of Connecticut's winter trees. As you look at trees this winter, think also about the many things that trees do for us. They give us many products, paper and wood being the most obvious, but also cellulose material necessary for the manufacture of plastics. Trees also contain raw materials for the production of gums, rubber, syrup and oils and provide us directly with fruits and nuts.

Not as obvious as the economic value of trees are the environmental benefits. Trees perform vital functions within our ecosystems. During the growing season, they provide us with oxygen, a byproduct of their food manufacturing process, photosynthesis. They maintain humidity by releasing water vapor into the air through transpiration and moderate temperatures on hot sunny days. Trees are able to trap and filter pollutants. The root systems of trees help to prevent erosion. Trees provide food and shelter for many species of animals, including man. Even when a tree dies it contributes to the ecosystem as, through the process of decay, many nutrients are released and returned to the soil to nourish living species.

Keys to Trees

1. Winter Tree Finder, by May T. & Tom Watts
2. Fruit Key & Twig Key to Trees & Shrubs, Wm. M. Harlow
3. Field Guide to Trees and Shrubs, (Peterson series), George A. Petrides
4. Trees of the Eastern & Central United States and Canada, Wm. M. Harlow

Answers: *a. American elm, b. Sugar maple, e. White ash, d. White oak, e. American beech, f. Basswood.*

Permits Issued

Water Resources

Inland Wetlands

October 27
Edward I. Bushka, No. 77-IW-154
Permit, with conditions, to pipe an existing watercourse which will drain into Welton Brook in Waterbury. This work is in conjunction with the road construction of a subdivision known as Coe Acres Section #19.

October 27
Ronald R. Renz, No. 77-IW-155
Permit, with conditions, to construct a pond and to divert Copper Mill Brook into the proposed pond eliminating approximately 800 feet of natural stream channel in the Town of Monroe. The activity also includes the replacing of culverts and an access drive.

October 27
Edwin J. Fijol, No. 77-IW-156
Permit, with conditions, to conduct a regulated activity within inland wetlands and watercourses in the Town of Bloomfield. The proposed work consists of the reconstruction and realignment of the intersection of Route 178 and Park Avenue in Bloomfield.

November 16
Town of Fairfield, No. 71
Permit to construct flood protection dikes along the southerly banks of Pine Creek and to the northerly side of Fairfield Beach Road in the Town of Fairfield.

Encroachments

November 1
Keyes Associates
Permit to replace a storm sewer outfall riverward of established stream channel encroachment lines for the Connecticut River in the Town of Rocky Hill.

Structures & Dredging

October 27
Frank Evers, No. SD-76150
Permit to construct and maintain a 4' by 45' pile and timber pier with a 24' ramp and a 10' by 20' float in the Goodwives River at Noroton, Connecticut.

October 27
Robert J. Lagasse, No. SD-77164
Permit to install and maintain a 35' by 2'6" dock and 6' by 10' float in Palmers Grove at Groton. Incidental dredging of 90 cubic yards will be disposed of on land in accordance with plans dated 6/14/77.

October 27
Town of East Haven, No. SD-77171
Permit, with conditions, to install and maintain a 60" RCP storm sewer through an existing seawall to provide drainage relief to the Cosey Beach Road area in accordance with plans dated 7/15/77.

October 27
Debra Beres, No. SD-77167
Permit to install and maintain a 20' by 2.4' wood pier, a 25' by 2.5' aluminum ramp and a 12' by 10' wood float to extend 42' from the mean high water line into the Mill River at Southport in accordance with plans dated 6/28/77.

November 8
Michael L. Fezza, No. SD-76171
Permit, with conditions, to construct and maintain a stone and concrete jetty beside Morris Creek in East Haven, Connecticut.

November 8
Flagship Marina-Kimar Realty
No. SD-77172
Permit, with conditions, to install and maintain a 150' by 3' seawall in the Housatonic River at Milford in accordance with plans dated 7/15/77.

November 8
City of New Haven, No. SD-77132
Permit to replace an existing wood jetty with a stone jetty in accordance with plans dated 10/3/77.

November 16
Town of Clinton, No. SD-76117
Permit, with conditions, to dredge 2800 cubic yards of material in Clinton Harbor in accordance with plans dated October 29, 1975.

See Supplement for other permits and notices of hearings.

DEP Citizens' Bulletin

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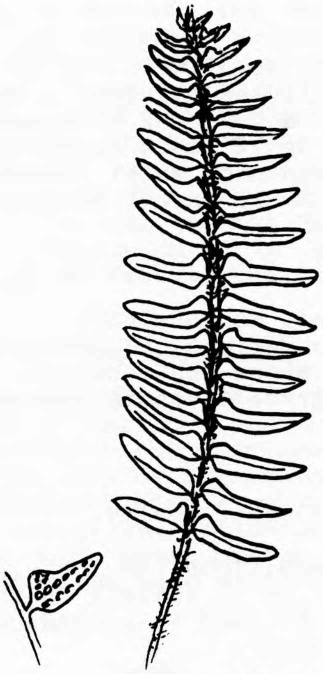
Trailside Botanizing

by G. Winston Carter



Pam Carter

Christmas Fern

(Polystrichum acrostichoides)

The Christmas Fern, one of the most striking and graceful of the evergreen ferns, may be observed during all seasons of the year. Part of the beauty of this interesting fern is its habit of growing in circular arching clumps. This type of fern produces two types of leaves, or fronds: fertile and sterile. The fertile fronds are taller, more rigid and more erect than the sterile. They possess spore-producing parts which aid in reproducing the plant. In winter the fertile fronds wither while the sterile fronds survive, though often flattened by frost.

The Christmas Fern is a very common type of fern which is often found in rocky shaded slopes, in soil that can be acid. neutral or alkaline, but it prefers an alkaline environment. It grows in colonies but more often singly, or in two's or three's. If it is growing on a barren slope, it performs an important role in retarding erosion and helping to rebuild soil.

One of the earliest ferns to develop each season, the new fronds unroll from "fiddleheads" at tips in early spring. They are scaly and stout and covered with gray silvery hairs. The fertile fronds contain fruit dots, or sori, near the central line of the underside of the leaflets, or pinnae, on the upper part of the frond. These fruit dots often cover the back of the leaflets completely and ripen from June to October.

The common name of this fern refers to its having been used for Christmas decoration by early New England settlers and because each leaflet gives the appearance of the foot of a Christmas stocking.

DEP citizens' bulletin

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